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# 1972 Suggested Insecticide Guide

## Insect Control BY THE HOMEOWNER

Much has been said about the effects of pesticides, particularly insecticides, on the health and well-being of the American people. The homeowner, however, is also aware that he is constantly faced with a horde of insects, intent upon destroying his property or making his life uncomfortable. Occasionally he can avoid or reduce the destruction wrought by some pests without using an insecticide, but to control most insects, he must rely on an insecticide. This will provide the satisfactory control that he demands.

By careful use of insecticides, the homeowner can enjoy reasonable freedom from insects without endangering either himself, his family, or his pets. He must recognize, however, that insecticides are designed to destroy one group of animals — insects — and can be harmful to other animals, including man himself, if used with disregard of normal safety precautions. It is up to each insecticide user to handle, apply, and store insecticides safely to reap their benefits without suffering from their dangers. For further information on safe use of pesticides Circular 906 is available from the College of Agriculture at Urbana.

The suggestions in this publication list certain insecticides to control insect pests of food, fabrics, structures, man and animals, lawns, shrubs, trees, flowers, and vegetables. We have tried to suggest only the safest materials that the homeowner needs. Many people prefer to employ the services of a professional exterminator or custom applicator rather than to become involved with selection and application of an insecticide.

The names used in these tables are the common coined chemical names, not the trade names, and as such may not be familiar to you. For instance, the common name for *Cygon* is *dimethoate*. If there is no coined chemical name, the trade name is used but is capitalized.

Requested label clearances for a few uses of some insecticides, carriers, and solvents is uncertain for 1972, since many requests have not yet been officially cleared.

Consequently, labels may be cancelled and the product removed from the market at any time. Anticipating this we took a conservative attitude a few years ago and began modifying these suggested uses. We have attempted to anticipate any further label changes in 1972, but there still may be an occasional use cancelled. Be sure to check with your local county extension adviser if you are not sure about the insecticide you plan to use. We will make announcements of label changes through the news media in an attempt to keep you up to date.

Suggestions for use of insecticides, effective from a practical standpoint, are based on available data. Many factors affect efficiency of control. Report details of control failures to us.

In using these tables always read the footnotes before using the insecticides. They list precautions and other pertinent information.

Leaflets on specific insects, their life history, habits, damage, and cultural control methods are available from the county extension adviser or by writing to Office of Agricultural Publications, University of Illinois College of Agriculture, Urbana, Illinois 61801. They are indicated in tables by NHE or Circular numbers.

Other circulars on insect control are:

- Circular 897 — Insect Control for Commercial Vegetable Crops and Greenhouse Vegetables;
- Circular 898 — Insect Control for Livestock and Livestock Barns;
- Circular 899 — Insect Control for Field Crops;
- Circular 1004 — Pest Control in Commercial Fruit Plantings.

These are available from the county offices or the College of Agriculture at Urbana.

These suggestions are subject to change without notification during the year.



## VEGETABLE INSECTS

Insects	Crop	Insecticide	Suggestions
Aphids (NHE-47) Leafhoppers (NHE-22) Mites (NHE-58) Thrips	Most garden crops	malathion	Apply on foliage to control the insects. Aphids and leafhoppers transmit plant diseases; early control is important. Mites web on the underside of leaves; apply insecticide to underside of leaves early before extensive webbing occurs.
Blister beetles (NHE-72) Cutworms (NHE-77) Flea beetles (NHE-36) Grasshoppers (NHE-74) Leafhoppers (NHE-22) Picnic beetles (NHE-40)	Most garden crops	carbaryl	For cutworms, attach collars of paper, aluminum foil, or metal at planting for small numbers of plants, or apply insecticide to base of plants at first sign of cutting. Control grasshoppers in garden borders when hoppers are small. For picnic beetles, pick and destroy overripe or damaged vegetables.
Wireworms (NHE-43) and other soil insects (NHE-23, 27)	Most garden crops	diazinon	When tearing up sod for a garden, apply to soil and rake in before planting.
All cabbage worms (NHE-45)	Cabbage and related crops, salad crops, and leafy vegetables	bacillus thuringiensis <sup>2</sup> carbaryl or malathion	Presence of white butterflies signals start of infestation. Control worms when small. It is almost impossible to raise cole crops in Illinois without controlling these pests.
Hornworms (NHE-130)	Tomatoes	carbaryl	Handpicking usually provides satisfactory control.
Earworms (NHE-33)	Tomatoes and sweet corn	carbaryl	Apply to late-maturing tomatoes 3 to 4 times at 5- to 10-day intervals from small-fruit stage. Apply at fresh-silk stage to early and late corn every 2 days 4 to 5 times.
Colorado potato beetles	Eggplant, potatoes, tomatoes	carbaryl	Apply as needed. Insects usually present only in late May and June.
Potato leafhoppers (NHE-22)	Potatoes, beans	carbaryl or malathion	Apply 3 to 4 times at weekly intervals starting in late May or early June. Late potatoes and beans require additional treatments. Most serious pest of potatoes and beans in Illinois.
Bean leaf beetles (NHE-67)	Beans	carbaryl	Leaves are riddled in early plantings. Apply once or twice as needed.
Mexican bean beetle	Beans	carbaryl	Except for southern Illinois, only a pest of late beans. Apply insecticide to underside of leaves.
Cucumber beetles (NHE-46)	Vine crops	carbaryl or malathion	Apply as soon as beetles appear in spring. When blossoming begins, apply insecticide late in the day so as not to interfere with pollination by bees.
Squash vine borers	Squash	carbaryl	Make weekly applications to crowns and runners when plants begin to vine. Apply late in day.
Squash bugs (NHE-51)	Squash and pumpkins	carbaryl	Apply as soon as small nymphs are seen and as needed. Does not kill large nymphs and mature bugs. Apply late in day.
Corn borer	Sweet corn	carbaryl	Apply 4 times every 3 days to whorl and ear zone of early corn when feeding appears on whorl leaves.

### Days to Wait Between Application and Harvest

	Collards, kale, and other leafy crops	Beans	Lettuce	Cabbage and related crops	Sweet corn	Onions	Vine crops <sup>1</sup>	Tomatoes	Pumpkin	Eggplant	Peas	Potatoes
carbaryl	14	0	14	3	0	..	0	0	0	0	0	0
malathion	7	1	14	7	5	3	1	1	3	3	3	0

<sup>1</sup> Only apply insecticide late in the day after blossoms have closed to avoid bee kill. <sup>2</sup> No time limitations.

### Amount of Insecticide for Volume of Spray

	1 gal.	6 gal.	100 gal.	Commercial dust
carbaryl (Sevin) 50% W.P.	2 tbl.	¾ cup	2 lb.	5%
malathion 50-57% E.C.	2 tsp.	4 tbl.	1 qt.	4%

Apply 1 ounce of actual diazinon per 1,000 square feet. To do this mix ¼ pint (4 fluid ounces) of 25% diazinon emulsion in enough water to cover 1,000 square feet, usually 2 to 3 gallons of water. Rake into soil.

Note: E.C. = emulsion concentrate; W.P. = wettable powder.

## FLOWER INSECTS

Insect	Insecticide <sup>1</sup>	Dosage	Suggestions
Ants, soil-nesting wasps, and sowbugs (NHE-17, 79, 93, 111)	Same as for ants under lawn insects on page 5.		
White grubs	Same as for white grubs under lawn insects on page 5.		
Aphids, mealybugs, lacebugs, scales, and white flies (NHE-7, 114)	malathion 50-57% E.C.	2 tsp. per gal. water	Spray foliage thoroughly. Repeat treatments may be needed.
Blister beetles (NHE-72)	carbaryl 50% W.P.	2 tbl. per gal. water	Spray foliage. Repeat treatments may be needed.
Cutworms (NHE-77)	diazinon 25% E.C.	6 oz. per 2-3 gal. water	Spray 1,000 sq. ft. soil at base of plants. Do not spray on plant foliage. Small numbers of plants can be protected with collars of paper, aluminum foil, or metal.
	diazinon 2% granules	5 lb. per 1,000 sq. ft.	
Grasshoppers (NHE-74)	carbaryl 50% W.P.	2 tbl. per gal. water	Spray foliage and also adjacent grassy or weedy areas.
	malathion 50-57% E.C.	2 tsp. per gal. water	
Iris borer	dimethoate (Cygon, DeFend) 23.4% E.C. or 25% W.P.	4 tsp. per gal. water	Apply when irises are in bloom, but not on blooms and make only one application. Add a small amount of liquid detergent to spray mix to improve coverage on leaves.
Leaf-feeding beetles	carbaryl 50% W.P.	2 tbl. per gal. water	Spray foliage. Repeat treatments if needed.
Leaf-feeding caterpillars	Same as for leaf-feeding beetles		
Plant bugs and leafhoppers	Same as for leaf-feeding beetles		
Slugs (NHE-84)	Metaldehyde		Apply as a bait to soil. Remove old leaves, stalks, poles, boards, and other debris where slugs like to hide and lay eggs.
Spider mites (NHE-58)	chlorobenzilate 25% W.P.	1 tsp. per gal. water	Pay particular attention to underside of leaves when spraying. Apply 2 or 3 times at weekly intervals.
	dicofol 18.5% E.C.	2 tsp. per gal. water	
Springtails	malathion 50-57% E.C. malathion 4% dust	2 tsp. per gal. water	Spray foliage and soil. Apply to soil at base of plants.
Stalk borers (NHE-24)	Same as for leaf-feeding beetles		Spray foliage thoroughly and frequently.
Thrips	Same as for leaf-feeding beetles		Spray foliage carefully.

<sup>1</sup> Do not use oil-base sprays on plants. Do not use malathion on African violets. Do not use carbaryl on Boston ivy. Do not use diazinon on ferns. Repeated use of carbaryl foliage sprays may cause mite or aphid infestations to increase and become damaging. Do not use insecticides during full bloom. Do not use dimethoate on chrysanthemums.

Note: E.C. = emulsion concentrate; W.P. = wettable powder. An emulsion concentrate is a chemical pesticide dissolved in a solvent to which an emulsifier has been added. It can then be mixed with water to the desired strength before being used.

### FOR YOUR PROTECTION

1. Store insecticides out of reach of children, irresponsible persons, or animals; store preferably in a locked cabinet.

2. If you use a bait around or in the home, place it after the children have retired and pick it up in the morning before they get up. Furthermore, place it out of their reach. At present we do not encourage use of baits for insect control.

3. Avoid breathing insecticide sprays and dusts over an extended period. This is particularly true in enclosed areas such as crawl spaces, closets, basements, and attics.

4. Wash with soap and water exposed parts of body and clothes contaminated with insecticide.

5. Wear rubber gloves when handling insecticide concentrates.

6. Do not smoke while handling or using insecticides.

7. Leave unused insecticides in their original containers with the labels on them and in locked cabinets.

8. Wash out and bury or burn and haul to the refuse dump empty insecticide containers.

9. Do not leave puddles of spray on impervious surfaces.

10. Do not apply insecticides to fish ponds.

11. Do not apply insecticides near dug wells or cisterns.

12. Observe all precautions listed on the label.

## TREE AND SHRUB INSECTS

Insects	Insecticide	Suggestions <sup>1</sup>
Aphids (NHE-7)	diazinon malathion	Spray foliage thoroughly with force. Repeat as needed.
Bagworms (NHE-6)	carbaryl diazinon malathion	Spray foliage thoroughly. Apply June 15. Later sprays are less effective.
Borers (NHE-8)	dimethoate	Spray trunk and limbs thoroughly in late May or early June. Wrap trunks of newly set trees with heavy paper for first two years or until trees are growing vigorously. Provide adequate water and fertilizer for vigorous growth.
Catalpa sphinx	carbaryl malathion	Spray foliage when feeding or worms are first noticed.
Eastern tent caterpillars	Same as for catalpa sphinx	Spray when nests are first noticed.
Elm leaf beetle (NHE-82)	carbaryl	Spray as soon as damage is noticed.
European pine shoot moths and Nantucket pine moth (NHE-83)	dimethoate	Spray ends of branches thoroughly in early June for European species and in mid-May for Nantucket species.
Fall webworms	carbaryl diazinon malathion	Spray when first webs appear; clip off and destroy infested branches or burn out webs.
Galls (NHE-80, 81)		
Elm cockscomb	diazinon	Spray foliage thoroughly when buds are unfolding.
Hickory	malathion	
Maple bladder		
Hackberry blister	diazinon malathion	Spray foliage thoroughly in late May. Kills psyllids in galls.
Cooley spruce	diazinon	Apply in late September or October or early spring just before buds swell.
Eastern spruce	malathion	
Green-striped mapleworms	Same as for catalpa sphinx	Spray as soon as damage is noticed.
Leaf miners	diazinon	Spray foliage thoroughly when mines first appear. Repeat treatment in 10 to 12 days.
Birch	malathion	
Boxwood		
Hawthorn		
Oak		
Mealybugs	malathion	Spray foliage thoroughly and with force. Repeat in two weeks.
Mimosa webworms (NHE-109)	carbaryl malathion	Spray foliage thoroughly when first nests appear (June, July). A repeat treatment may be needed.
Mites (NHE-58)	chlorobenzilate dicofol	Pay particular attention to underside of leaves. Apply 2 or 3 times at weekly intervals.
Oak kermes	malathion	Spray foliage thoroughly about July 1 to kill the crawlers.
Periodical cicadas (NHE-113)	carbaryl	Spray all branches thoroughly when adults appear. Repeat in 7 to 10 days.
Sawflies	Same as for fall webworms	Spray as soon as worms or damage is evident.
Scale (NHE-114)	diazinon malathion	Spray foliage thoroughly in early April for <i>Fletcher</i> and <i>European elm scale</i> ; in late May for <i>pine needle</i> and <i>sweet gum scale</i> ; in early June for <i>scurfy</i> , <i>oystershell</i> , and <i>euonymous scale</i> ; in early July for <i>cottony maple</i> , <i>Juniper</i> , and <i>dogwood scales</i> ; in mid-July for <i>spruce bud scale</i> ; and again in early August for <i>oystershell scale</i> .
Putnam	dormant oil diluted	Apply when plants are still dormant in late winter. Do not use on evergreens.
San Jose	according to label	For tulip tree scale, a malathion spray in late September or in early spring is also effective.
Tulip tree		

<sup>1</sup> Treatment dates are listed for central Illinois. In southern Illinois apply 2 weeks earlier and in northern Illinois 2 weeks later.



## TREE AND SHRUB INSECTS (continued)

Insects	Insecticide	Suggestions <sup>1</sup>
Spring cankerworms	Same as for catalpa sphinx	When leaf buds open in spring, while worms are still small.
Sycamore lace bugs	carbaryl malathion	Spray when nymphs appear, usually in late May.
Thrips	Same as for aphids	Mainly on privet. Spray foliage thoroughly.
Yellow-necked caterpillars	Same as for catalpa sphinx	Spray foliage when worms are small.
Zimmerman pine moths	malathion	Spray in mid-August and again two weeks later. In each spray use twice the amount of malathion suggested in the chart below.

<sup>1</sup> Treatment dates are listed for central Illinois. In southern Illinois apply 2 weeks earlier and in northern Illinois 2 weeks later.

### Amount of Insecticide Needed for Volume of Spray

	1 gal.	6 gal.	100 gal.		1 gal.	6 gal.	100 gal.
carbaryl (Sevin) 50% W.P. <sup>1</sup>	2 tbl.	$\frac{3}{4}$ cup	2 lb.	dicofol (Kelthane) 18.5% E.C.	2 tsp.	4 tbl.	1 qt.
diazinon 25% E.C. <sup>2</sup>	2 tsp.	4 tbl.	1 qt.	dimethoate (Cygon, DeFend)	2 tsp.	4 tbl.	1 qt.
malathion 50-57% E.C. <sup>3</sup>	2 tsp.	4 tbl.	1 qt.	23.4% E.C., 25% W.P. <sup>4</sup>			
chlorobenzilate 25% W.P.	1 tsp.	2 tbl.	2 lb.				

<sup>1</sup> Do not use on Boston ivy. <sup>2</sup> Do not use on ferns or hibiscus. <sup>3</sup> Do not use on canaert red cedar. <sup>4</sup> Do not use on chrysanthemums.

Note: E.C. = emulsion concentrate; W.P. = wettable powder.

## LAWN INSECTS

Insects	Insecticide <sup>1</sup>	Dosage per 1,000 sq. ft. <sup>2</sup>	Suggestions
True white grubs (NHE-23)	chlordane 45% E.C.	$\frac{1}{2}$ cup	This treatment provides 5-year protection. In established sod, apply as granules or spray to small area and then water in very thoroughly before treating another small area. For new seedings, mix in soil before planting. Do not plant vegetable root crops in treated soil for 5 years.
Annual white grubs	40% W.P.	5 oz.	
Japanese beetle larvae	10% G.	1 $\frac{1}{4}$ lb.	
Green June beetle larvae	5%	2 $\frac{1}{2}$ lb.	
Ants (NHE-111)			
Ants (NHE-111)	diazinon 25% E.C.	$\frac{3}{4}$ cup	Apply as spray or granules and water in thoroughly. For individual nests pour 1% diazinon in nest. Seal in with dirt.
Cicada killer and other soil-nesting wasps (NHE-57, 79)	2% G.	5 lb.	
Sod webworms	carbaryl 50% W.P.	$\frac{1}{2}$ lb.	As sprays, use at least 2.5 gal. of water per 1,000 sq. ft. Do not water for 72 hours after treatment. As granules, apply from fertilizer spreader.
Millipedes and sowbugs (NHE-93, 115)	5% G.	4 lb.	
	diazinon 25% E.C.	$\frac{3}{4}$ cup	
	2% G.	5 lb.	
	trichlorfon 50% W.P.	4 oz.	
	5% G.	2 $\frac{1}{2}$ lb.	
Armyworms	carbaryl 50% W.P.	2 oz.	Apply as sprays or granules. Use 5 to 10 gal. of water per 1,000 sq. ft.
Cutworms	5% G.	1 lb.	
Chinch bugs			
Leafhoppers	carbaryl 50% W.P.	2 oz.	Apply as a spray.
	methoxychlor 25% E.C.	2 oz.	
Aphids	malathion 50-57% E.C.	1 tbl.	Spray grass thoroughly.
Chiggers	diazinon	1 tbl.	Spray grass thoroughly.
Mites	dicofol 18.5% E.C.	1 tbl.	Spray grass thoroughly, 2 to 2.5 gal. of water per 1,000 sq. ft.
	malathion 50-57% E.C.	1 tbl.	
Slugs (NHE-84)	Slug baits	Scatter in grass	Apply where slugs are numerous.

<sup>1</sup> E.C. = emulsion concentrate; W.P. = wettable powder; G. = granules.

<sup>2</sup> To determine lawn size in square feet, multiply length times width of lawn and subtract non-lawn areas including house, driveway, garden, etc. Do not allow people or pets on lawn until the spray has dried.

## ANIMAL AND NUISANCE INSECTS

Insects <sup>1</sup>	Insecticide <sup>2</sup>	Method of application	Suggestions
Ants (NHE-111) Crickets Spiders (NHE-116) (NHE-17)	chlordane 1% spray diazinon 0.5% spray diazinon 0.5% P.S.C. Baygon 0.5% P.S.C.	<i>Outdoors:</i> Use a waterbase spray of chlordane or diazinon. Spray on outside of foundation of house.	To prevent insect migrations into house, spray completely around outside foundation wall and adjacent 4-inch strip of soil. <i>Indoors:</i> Use diazinon or Baygon oil-base sprays in pressurized spray cans. Apply to baseboards, cracks, and door thresholds.
Bed bugs	malathion 1% spray	Spray slats, springs, and bed frame thoroughly.	Apply a light spray to seams, tufts, and folds of mattresses. Dry before use. Use clean bedding.
Booklice or barklice	diazinon 0.5% in P.S.C. Baygon 0.5% in P.S.C.	Spray undersides of bookshelves and infested areas.	Remove books and papers from damp storage areas; spray where booklice are found. Improve ventilation.
Boxelder bugs (NHE-9)	diazinon 0.5% spray carbaryl 1% spray	<i>Outdoors:</i> Spray trunks of infested boxelder trees during late summer when bugs are present.	<i>Outdoors:</i> Spray the clusters of boxelder bugs on trunks of trees, foundation walls, under eaves, and other areas where they gather. Removal of seed-bearing boxelder trees is also helpful. <i>Indoors:</i> Remove with vacuum or broom.
Chiggers (NHE-127)	malathion 1% spray diazinon 0.5% spray	<i>Outdoors:</i> Treat bushes, lawn, fence rows, along roadsides, and areas not regularly mowed.	For personal protection repellents such as DEET, OFF, 612, etc., will prevent attack.
Wood ticks (NHE-56)	carbaryl 1% spray diazinon 0.5% spray malathion 1% spray		
Clover mites (NHE-2)	chlorobenzilate 0.03% spray dicofol 0.03% spray malathion 1% spray pyrethrin 0.1% P.S.C.	Purchase E.C. and dilute with water. Spray outside of house from ground up to windows and adjacent 10 ft. of lawn. Repeat in 7-10 days if necessary.	Remove grass and weeds from 18-inch strip next to foundation. <i>Indoors:</i> Vacuum, or spray with 0.1% pyrethrin in house.
Cluster flies (NHE-1)	dichlorvos 20% resin strip <sup>3</sup> pyrethrin 0.1% P.S.C.	1 strip per 1,000 cu. ft. in attic or room. Fog lightly in room. Repeat as needed.	Seal cracks around windows, eaves, and siding to prevent entry.
Drain flies (NHE-91)	<i>Outdoors:</i> malathion 0.5% spray  <i>Indoors:</i> pyrethrin 0.1% in P.S.C., or 20% dichlorvos resin strip <sup>3</sup>	Spray shrubbery, tall grass and refuse containers.  Use fine mist or fog of pyrethrin or 1 resin strip per 1,000 cu. ft.	<i>Indoors:</i> Use chemicals only after solving sanitation problems. Clean out overflow drains, drain traps, and cellar drains. Pour boiling water or rubbing alcohol into overflow drain to eliminate maggots.
Elm leaf beetles (NHE-82)	pyrethrin 0.1% P.S.C. carbaryl 1% spray	Use aerosol sprays for quick kill, or collect with vacuum or broom.	Sprays with carbaryl on nearby Chinese elm trees for control of elm leaf beetle larvae will help.
Fleas (NHE-107) Brown dog tick (NHE-56)	carbaryl 5% dust malathion 4% dust diazinon 0.5% P.S.C. Baygon 0.5% P.S.C.	Dust areas inside and outside the home where the pet rests. Dust pets directly as needed.	<i>Indoors:</i> For heavy infestations of ticks or fleas use diazinon or Baygon to treat baseboards, around rugs, under furniture, door casings, cracks, etc. Vacuum rugs and upholstered furniture thoroughly.
Flies (NHE-16) Gnats Mosquitoes (NHE-94)	<i>Outdoors:</i> malathion 1% spray  <i>Indoors:</i> pyrethrin 0.1% space spray; or dichlorvos 20% resin strips <sup>3</sup>	Purchase E.C. and dilute with water. Spray shrubbery, flowers, tall grass, around doorways and refuse containers and other resting sites.  Use fine mist or fog of pyrethrin or use one 20% slow release dichlorvos resin strip per 1,000 cu. ft.	Dispose of refuse twice each week. Eliminate standing water in eaves, troughs, old tires, toys, tin cans, etc.  Use screening and keep repaired. Dichlorvos resin strips give good control in tight enclosed areas for about 3 months. Fly swatters are also effective.

<sup>1</sup> Leaflets on specific insects, their life history, habits, damage, and cultural control methods are indicated by NHE or circular numbers. These are available from the county extension adviser or by writing to Office of Agricultural Publications, University of Illinois College of Agriculture, Urbana, Illinois 61801.

<sup>2</sup> Whenever possible purchase specially prepared ready-to-use forms of insecticides for indoor use. When preparing a quantity of 1 gallon or more of a spray of a desired percentage, use the dilution table on page 8. You need to know only the formulation of the insecticide when using the dilution table.

<sup>3</sup> Do not use in pet shops or if tropical fish are present. Do not use in kitchens, restaurants, or areas where food is present. Do not use in nurseries or rooms where infants, ill, or aged persons are confined.

Note: E.C. = emulsion concentrate; W.P. = wettable powder; P.S.C. = pressurized spray can; O. = oil solution (usually in pressurized spray can).

(SEE PESTICIDE DILUTION TABLE ON PAGE 8)



## ANIMAL AND NUISANCE INSECTS (Continued)

Insects <sup>1</sup>	Insecticide <sup>2</sup>	Method of application	Suggestions
Ground beetles Black vine weevils Clover leaf weevils	chlordane 1% spray diazinon 0.5% spray carbaryl 1% spray	Spray outside foundation of house.	<i>Indoors:</i> Use vacuum and pick up beetles. They are attracted to indoor and porch lights. Where possible use yellow bulbs outside.
Millipedes, centipedes, sowbugs (NHE-93)	diazinon 0.5% spray carbaryl 1% spray trichlorfon 1% spray	Spray outside foundation and at least 3 ft. of adjacent soil.	Treat entire lawn as for webworms if pests are abundant. Remove debris from ground along foundation. Collect with vacuum when found indoors.
Picnic Beetles	carbaryl 1% spray malathion 1% spray diazinon 0.5% spray	Apply to garbage pails, decaying vegetables, and refuse frequented by these beetles.	Additional treatments every 4 or 5 days may be needed. Pick fruits and vegetables before they become overripe to reduce the problem.
Springtails (NHE-70)	chlordane 1% spray diazinon 0.5% spray malathion 0.5% spray	<i>Outdoors:</i> Spray soil next to the house, especially grassy moist areas.	Eliminate low moist spots around the house. <i>Indoors:</i> Use vacuum.
Wasps (NHE-79) Hornets (NHE-17) Bees	dichlorvos 0.5% P.S.C. dichlorvos 20% resin strip <sup>3</sup> carbaryl 1% spray or 5% dust; or malathion 1% spray or 4% dust	Treat nests of bees, wasps, or hornets after dark. Hanging dichlorvos resin strips in attic will help prevent infestations.	For nests below ground, apply carbaryl and seal opening with soil. For bees, spray nests in partitions. Drill holes through siding to inject insecticide, if necessary. Nests and honey should be removed and destroyed.

## FOOD, FABRIC, AND STRUCTURAL INSECTS

Insects <sup>1</sup>	Insecticide <sup>2</sup>	Method of application	Suggestions
Carpenter ants (NHE-10)	chlordane 2% O. or 5% dust	Spray or dust nest entrances and runways.	Use foundation spray as recommended for ants. They are difficult to control. Nests should be treated directly for best results.
Carpet beetles (NHE-87) Tissue paper beetles Clothes moths (NHE-87) Larder beetles	diazinon 0.5% P.S.C.	Spray storage areas and infested places like the back and edge of carpeting, baseboards, beneath drawers, etc.	Prevent lint and dust from accumulating. Treat crevices, cracks, closets, and infested areas of shelving. Clean hot air registers and cold air shafts. Dry cleaning kills these pests. Store cleaned or washed woollens in insect-free chests and plastic bags.
Cockroaches: German (NHE-3) Brown-banded (NHE-4) American (NHE-5) Oriental (NHE-5)	diazinon 0.5% P.S.C. Baygon 0.5% P.S.C.	Spray runways and hiding places. Repeat treatments may be needed in 2 or 3 weeks.	Treat under sink, refrigerator, cabinets, on baseboards, etc. Complete treatment throughout home may be needed for successful control of brown-banded roach.
Pantry and cereal insects Saw-toothed grain beetles (NHE-11) Cigarette beetles	diazinon 0.5% P.S.C. <sup>4</sup> Baygon 0.5% P.S.C. <sup>4</sup> pyrethrin 0.1% P.S.C.	Spray inside of food cabinets very lightly and only after shelves are empty and cleaned.	Discard infected packages. Scrub or vacuum food cabinets and shelves. Force spray into cracks and crevices; allow to dry; cover shelves with clean, fresh paper. Do not contaminate food or utensils with insecticide.
Powder-post beetles (NHE-85)	chlordane 2% O. Pentachlorophenol 5% O.	Paint, spray, or dip to saturate infested wood.	Pentachlorophenol is a wood preservative also, but it has a strong persistent odor. Follow label directions.
Silverfish (NHE-86)	diazinon 0.5% P.S.C. Baygon 0.5% P.S.C.	Spray runways, baseboards, closets, and places where pipes go through the walls.	Repeat treatments in 2 weeks if needed. Keep books and papers in dry places.
Termites (NHE-57)	chlordane 1% Purchase E.C. and dilute with water or oil	Soak 6-inch width of soil down to footing around and beneath building, 1 gal. per 2 cu. ft. of soil.	Remove termite mud tubes connecting wood to soil. Eliminate wood-to-soil contacts. Ventilate to keep unexcavated areas dry.

<sup>1</sup> Leaflets on specific insects, their life history, habits, damage, and cultural control methods are indicated by NHE or circular numbers. These are available from the county extension adviser or by writing to Office of Agricultural Publications, University of Illinois College of Agriculture, Urbana, Illinois 61801.

<sup>2</sup> Whenever possible purchase specially prepared ready-to-use forms of insecticides for indoor use. When preparing a quantity of 1 gallon or more of a spray of a desired percentage, use the dilution table on page 8. You need to know only the formulation of the insecticide when using the dilution table.

<sup>3</sup> Do not use in pet shops or if tropical fish are present. Do not use in kitchens, restaurants, or areas where food is present. Do not use in nurseries or rooms where infants, ill, or aged persons are confined.

<sup>4</sup> For use only by pest control operators. Homeowners should use 0.1% pyrethrin.

Note: E.C. = emulsion concentrate; W.P. = wettable powder; P.S.C. = pressurized spray can; O. = oil solution (usually in pressurized spray can).

(SEE PESTICIDE DILUTION TABLE ON PAGE 8)

## PESTICIDE DILUTION TABLE

**HOW TO USE:** When preparing a spray of a desired percentage you need to know only the formulation of the particular product. (Examples: Kelthane 18.5% wettable powder; Kelthane 18.5% emulsion concentrate.) For instance, if you were preparing a 1% chlordane solution for spraying the foundation of the home, you would mix 5 tablespoons of chlordane 45% E.C. into each gallon of water. The formulations of insecticides in the following table may be purchased

from hardware stores, pest control establishments, lawn and garden centers, and other sources. For some jobs, such as spraying outdoors to control flies or mosquitoes, a gallon or more of properly diluted spray is required. To obtain the percent concentration suggested for controlling a particular insect, add the amount of pesticide suggested in the following table to one gallon of water.

Pesticide formulation	Amount of insecticide needed per gallon of spray		
	Desired concentration		
	0.03%	0.5%	1.0%
carbaryl (Sevin) 50% W.P.	..	4 tbsp.	8 tbsp.
chlordane 45% E.C.	..	8 tsp.	5 tbsp.
chlordane 72% E.C.	..	4 tsp.	8 tsp.
chlorobenzilate 25% E.C.	1 tsp.	..	..
chlorobenzilate 45% E.C.	½ tsp.	..	..
chlorobenzilate 25% W.P.	1½ tsp.	..	..
diazinon (Spectracide) 25% E.C.	..	5 tbsp.	10 tbsp.
dicofol (Kelthane) 18.5% W.P.	2 tsp.	..	..
dicofol (Kelthane) 18.5% E.C.	1½ tsp.	..	..
malathion 50-57% E.C.	..	7 tsp.	4½ tbsp.
trichlorfon (Dylox) 80% W.P.	..	8 tsp.	1¾ oz.

(tbsp. = tablespoon; tsp. = teaspoon)

## CONVERSION TABLE FOR SMALL QUANTITIES

1 level tablespoon = 3 level teaspoons
1 fluid ounce = 2 tablespoons
1 cup = 8 fluid ounces or 16 tablespoons
1 pint = 2 cups
1 quart = 2 pints or 32 fluid ounces
1 gallon = 4 quarts or 128 fluid ounces

## COMMON NAMES OF INSECTICIDES

Below is a list of the common names of insecticides used in these tables, followed by the commercial trade name in parentheses, and the chemical name. These are listed to aid you in purchasing pesticides in pressurized spray cans. The label on the container usually lists these products by the common name or chemical name. Be sure to read the label.

carbaryl (Sevin).....	1-naphthyl methylcarbamate
chlorobenzilate (Acaraben).....	ethyl 4, 4'-dichlorobenzilate
deet (Off, Kik).....	N, N-diethyl-m-toluamide
diazinon (Spectracide).....	O, O-diethyl O-(2-isopropyl-4-methyl-6-pyrimidyl) phosphorothioate
dichlorvos (Vapona, DDVP).....	2,2-dichlorovinyl dimethyl phosphate
dicofol (Kelthane).....	4,4'-dichloro-a-(tri = chloromethyl) benzhydrol
dimethoate (DeFend, Cygon).....	O, O-Dimethyl S-(N-Methyl carbamoyl methyl) phosphorodithioate
ethyl hexanediol (6-12, Rutgers 612).....	2-ethyl-1, 3-hexanediol
malathion (Cythion).....	diethyl mercaptosuccinate, S-ester with O,O-dimethyl phosphorothioate
propoxur (Baygon).....	O-isopropoxyphenyl methylcarbamate
pyrethrin .....	principally from plant species <i>Chrysanthemum cinariaefolium</i>









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